

CHARGE PUMP USING DYNAMIC CHARGE BALANCE  
COMPENSATION CIRCUIT AND METHOD OF OPERATION

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## ABSTRACT OF THE DISCLOSURE

A charge pump comprises a first current mirror that injects a first charging current onto a loop filter and a second charging current onto an integrator capacitor. The first and second 10 charging currents are controlled by a first common control signal. The first charging current mirrors the second charging current. A second current mirror drains a first discharging current from the loop filter and a second discharging current from the integrator capacitor. The first and second discharging 15 currents are controlled by a second common control signal. The first discharging current mirrors the second discharging current. A sampling circuit couples the second charging and discharging currents to the integrator capacitor, which charges or discharges with a difference current between the second charging and 20 discharging currents. A control circuit detects a voltage difference between the loop filter and integrator capacitor and adjusts the first common control signal to minimize the voltage difference.